

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 23 FEB 2006

WIPO

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Applicant's or agent's file reference <b>M/45271-PCT</b>	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/010930</b>	International filing date ( <i>day/month/year</i> ) <b>30.09.2004</b>	Priority date ( <i>day/month/year</i> ) <b>01.10.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>H01M8/02</b>			
Applicant <b>NUVERA FUEL CELLS EUROPE S.R.L. et al.</b>			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 7 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> <i>sent to the applicant and to the International Bureau</i> a total of    sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> ( <i>sent to the International Bureau only</i> ) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).			
4. This report contains indications relating to the following items: <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Box No. I      Basis of the opinion  <input checked="" type="checkbox"/> Box No. II     Priority  <input checked="" type="checkbox"/> Box No. III    Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  <input type="checkbox"/> Box No. IV    Lack of unity of invention  <input checked="" type="checkbox"/> Box No. V     Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  <input type="checkbox"/> Box No. VI    Certain documents cited  <input type="checkbox"/> Box No. VII    Certain defects in the international application  <input checked="" type="checkbox"/> Box No. VIII   Certain observations on the international application                 </div>			
Date of submission of the demand  <b>08.12.2005</b>		Date of completion of this report  <b>22.02.2006</b>	
Name and mailing address of the international preliminary examining authority: <div style="margin-left: 20px;">                      European Patent Office                      D-80298 Munich                      Tel. +49 89 2399 - 0 Tx: 523656 epmu d                      Fax: +49 89 2399 - 4465                 </div>		Authorized Officer  <b>Fitzpatrick, J</b>  Telephone No. +49 89 2399-8570	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/010930

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-14 as originally filed

**Drawings, Sheets**

1/3-3/3 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify):*
  - ☐ any table(s) related to sequence listing *(specify):*
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify):*
  - ☐ any table(s) related to sequence listing *(specify):*

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/010930

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**Box No. II Priority**

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1. ☐ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
- ☐ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
  - ☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

**see separate sheet**

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

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1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 14

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 14 are so unclear that no meaningful opinion could be formed (*specify*):

**see separate sheet**

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/010930

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	
Inventive step (IS)	Yes: Claims	1-13
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Section II.3: Priority - Additional Observations**

From the original Italian priority document MI20031881 and on the basis of the current set of claims, the priority appears to be validly claimed.

**Section V.2: Citations and Observations**

(i) Document WO02/23645 (D1) discloses a liquid cooled bipolar separator plate assembly for use in the construction of a fuel cell and whereby the structure is positioned between MEA assemblies. The bipolar separator plate comprises a pair of rectangular distributor plates (11, 11') having perforations 20 and disposed in spaced parallel relationship by an intermediate structure. This structure may be comprised of two corrugated plates 12 of undulated cross-section with each plate defining longitudinal peaks and valleys. The separator plates are also rectangular plates and are interconnected in back-to-back relationship at the peaks to form a group of inner adjacent cooling liquid channels 15 therebetween and a first and second group of outer gas channels 16 and 17 on opposed outer sides of the interconnected separator plates. The peaks are secured to a respective one of the perforated distributor plates by welding on the outer sides. The inner cooling liquid channels and the outer gas channels are opened at opposed end edges of the interconnected separator and distributor plates. From the detail given in the figures, the perforations 20 are clearly constant in size and ordered. They are thus fairly considered as calibrated. Although the use(s) to which the product components of the structure are put are only limiting to the extent that said components should be suitable for said use(s), the disclosure of document D1 is still not prejudicial to the novelty of the subject matters of current main claims 1 and 12.

(ii) The applicant has in this regard argued that document D1 does not disclose the sheets 11 and 11' being welded through at least one corrugated member. This can not however be accepted in view of the above in combination with the paragraph bridging pages 5 and 6 of D1 which confirms that the two separator plates are first welded together and then welded to the distributor plates 11, 11'. These plates are thus clearly welded "through" corrugated conductive elements 12 which is all that claim 1 requires. In particular the Applicant's argument that "A welding ..... of the undulated section to the plates is not mentioned in D1 at all" is not acceptable in that current claim 1 does not require that the undulated or corrugated section is welded to the plates but rather merely that the sheets are welded through at least one corrugated conductive element (which may comprise both

corrugated and non-corrugated sections !)

(iii) The perforated distributor sheets 11 and 11' of D1 are effectively synonymous with the cathode and anode sheets of current claim 1 but do not delimit a passage section of a cooling fluid. This function is rather accomplished via the two plates 12. Novelty is thus assured. As the currently claimed arrangement moreover facilitates a direct contact between the cooling fluid and the cathode and anode sheets, an advantage not offered in D1, a more efficient cooling can be expected. Inventive step can thus also be acknowledged.

#### **Section VIII: Certain Observations**

The application infringes the requirements of Art.6 PCT in the following respects:

(i) Further to point (ii) of section V.2 above, independent claim 1 is required to read that "said sheets are welded .... through **the corrugations** of at least one corrugated conductive member ... ". In particular, there is no fair basis for any other manner of connection (such as the flange sections 22 of corrugated elements 12 of document D1) in the entire original application.

(ii) The two embodiments of the invention described on pages 5 and the additional embodiment on page 7 referring to "or otherwise secured" do not fall within the scope of the claims, which requires the cathode and anode sheets to be "welded or metallurgically bonded" through the corrugated conductive element.. This inconsistency between the claims and the description leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear, Article 6 PCT.

(iii) The description moreover does not indicate any other methods of securing said sheets in a manner suitable for a fuel cell stack. In this regard, the simple act of applying pressure to secure said sheets would be still covered by these disclosures in the description. Such can clearly however not be intended as the invention addresses inter alia the problem of facilitating easier assembly by providing the integral bipolar separator as claimed. The features of being "welded or metallurgically bonded" are thus features essential to the invention within the contexts of Art.6 PCT and Art.33(3) PCT (inventive step). The above discrepancies must thus be resolved via excision of the offending terms from the

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/010930

description.

(iv) Claim 14 does not meet the requirements of Article 6 PCT in that in merely referring to the drawings, the matter for which protection is sought is not clearly defined.